

REMARKS/ARGUMENTS

Status of the Claims

Upon entry of the present amendment, claims 5-18 and 20-25 are pending. Claims 5, 9, 13, 20 and 25 are amended. Claims 1-4 and 19 are canceled without disclaimer or prejudice to renewal.

Claims 5 and 9 are amended to set forth that the chamber has approximately the shape of a cuboid having side lengths which are substantially equal. Support is found, for example, in claim 19 as originally filed in on page 7, lines 7-8.

Claim 5 is amended to set forth a predetermined elliptical trajectory. Support is found, for example, in Figure 16.

Claim 13 is amended to set forth that the side wall is located in face of said active surface of said chip shaped carrier. Support is found, for example, on page 6, lines 19-22 and in Figure 8.

Claims 20 and 25 are amended to depend from a pending claim.

No new matter is introduced by the present amendments, and the Examiner is respectfully requested to enter them.

Claim Objections

The Examiner objected to claim 13 for grammatical awkwardness. In response, Applicants have amended claim 13 to grammatically correct.

The Examiner objected to claim 25 for depending from a canceled claim. In response, Applicants have amended claim 25 to depend from a pending claim.

Rejection under 35 U.S.C. § 102(b)

The Examiner rejected claims 9-12, 21 and 24 under 35 U.S.C. § 102(b) as allegedly anticipated by EP 1 161 984 ("Lehmann"). Applicants do not agree with the Examiner's position. However, in the interest of furthering prosecution, Applicants have amended claim 9 to set forth that the chamber has approximately the shape of a cuboid having

substantially equal side lengths. Lehmann does not disclose or suggest a chamber having a shape that is approximately cuboid and having side lengths which are substantially equal. Instead, Lehmann discloses a cartridge having a chamber that is rectangular, having a thickness that is much smaller than the width and the length of the chamber. *See*, Figure 5 and paragraph [0034] of Lehmann. Claims 10-12, 21 and 24 depend from claim 9 and therefore include all of the elements set forth in claim 9. Applicants note that claim 19 was not included in this rejection. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

Rejections under 35 U.S.C. § 103(a)

Lehmann in view of EP 1224976 ("Vischer")

The Examiner has rejected claim 1 under 35 U.S.C. § 103(a) as allegedly rendered obvious by Lehmann in view of EP 1 224 976 ("Vischer"). Applicants assume that the Examiner intended to reject claim 5 in this rejection. To the extent that the present rejection applies to the amended claims, Applicants respectfully traverse.

To establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference must teach or suggest all the claims limitations. M.P.E.P. § 2143.

Applicants do not agree with the Examiner's position. However, in the interest of furthering prosecution, Applicants have amended claim 5 to set forth that the chamber has approximately the shape of a cuboid with substantially equal side lengths. Here, the combined disclosures of Lehmann and Vischer do not disclose or suggest all of the elements of the reaction vessel of the claimed system. The vessels disclosed by Lehmann and Vischer are employed in fundamentally different systems, with different fluid delivery and mixing mechanisms, for example. It follows that the shapes and designs of the present reaction vessels and those of Lehmann and Vischer are also different.

Lehmann does not disclose or suggest a reaction vessel comprising a *tubular* (*i.e.*, effectively cylindrical) body with an upper opening and comprising a chamber that has

approximately the shape of a cuboid, having substantially equal side lengths.¹ Lehmann does not disclose or suggest a chamber adapted for receiving a pipetting tip introduced into the reaction vessel through an upper opening. Instead, Lehman discloses a rectangular cartridge comprising a rectangular chamber, having a thickness that is much smaller than the width and the length of the chamber. *See*, Figures 1 and 5, and paragraph [0034] of Lehmann. Lehman does not mention the word “pipette.”

Vischer does not supply the elements missing from Lehmann. Vischer also does not disclose a reaction vessel comprising a tubular body with an upper opening and comprising a chamber that has approximately the shape of a cuboid, having substantially equal side lengths. Vischer also does not disclose or suggest a chamber adapted for receiving a pipetting tip *introduced into the reaction vessel* through an upper opening. Instead of a reaction vessel having a straight tubular chamber, Vischer discloses a “U-shaped” reaction vessel in order to produce channels that yield a low Reynolds number and achieve laminar flow. *See*, paragraphs [0028-0029] of Vischer. In contrast to the present invention, Vischer discloses introducing a needle pipette into a section of the “U-shaped” vessel spatially removed from the chip. *See*, Figure 1 and paragraphs [0019] and [0054] of Vischer. Finally, unlike the present system which moves the vessel along a predetermined elliptical trajectory, Vischer discloses oscillating the vessel back and forth. *See*, paragraphs [0029] and [0034-0035] of Vischer.

Therefore, the combined disclosures of Lehmann and Vischer do not disclose or suggest all of the elements of amended claim 5 and do not render the invention obvious. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

Lehmann in view of Vischer, further in view of U.S. Patent No. 5,133,937 (“Frackelton”)

The Examiner has rejected claims 6-8 and 13-16 under 35 U.S.C. § 103(a) as allegedly rendered obvious by Lehmann in view of Vischer and further in view of Frackelton. To the extent that this rejection applies to the amended claims, this rejection is respectfully traversed. Claims 6-8 depend directly or indirectly from claim 5, and therefore require all of the

¹ The definition for “tubular” and “tube” from Merriam-Webster’s Collegiate Dictionary, Tenth Edition is provided as Exhibit A.

elements set forth in claim 5. Claims 13-16 depend directly or indirectly from claim 9, therefore require all of the element set forth in claim 9.

Both claims 5 and 9 require a reaction vessel comprising (i) a straight tubular chamber, (ii) adapted for receiving a pipetting tip introduced into the reaction vessel, and (iii) having approximately the shape of a cuboid, having substantially equal side lengths. The system of claim 5 requires a means for moving a vessel holder along a predetermined elliptical trajectory.

The combined disclosures of Lehmann and Vischer do not disclose or suggest all of the required elements of the claimed system for the reasons discussed above. Frackelton does not supply the elements missing from Lehmann and Vischer. Frackelton also does not disclose or suggest a reaction vessel comprising a chamber adapted for receiving a pipetting tip introduced into the reaction vessel or a means for moving a vessel holder along a predetermined elliptical trajectory.

Because the combined disclosures of Lehmann, Vischer and Frackelton do not disclose or suggest all of the elements of claimed systems, they do not render the invention obvious. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

Lehmann as applied to claim 9

The Examiner has rejected claims 17-20, 22 and 23 under 35 U.S.C. § 103(a) as allegedly rendered obvious over Lehmann. Claims 17-20, 22 and 23 depend directly or indirectly from claim 9. The Examiner alleges that the rejected claims are directed to embodiments that are mere optimization over the reaction vessel of claim 9. *See*, pages 8-9 of the present Office Action. To the extent that the present rejection applies to the amended claims, this rejection is respectfully traversed.

As discussed above, the cartridge disclosed by Lehmann is used in a fundamentally different system, and the design of the cartridge reflects this. For example, the reaction vessel of the present invention is designed for receiving a pipette tip introduced into the reaction vessel through the upper opening. Therefore, it has a tubular body, a chamber that extends straight between the upper opening and the bottom wall, and an upper opening that can

receive a pipette tip. In contrast, Lehmann does not mention the word “pipette.” As discussed above, the cartridge disclosed in Lehmann does not have a tubular body or a chamber that extends straight between the upper opening and the bottom wall. The reaction vessel of the present invention is also designed for effective vortex mixing and to allow for efficient removal of nearly all liquid by a simple pipetting operation. *See, e.g.*, page 3, line 29 bridging to page 4, line 2; page 5, line 35 bridging to page 6, line 5; and page 7, lines 10-12 of the present specification. This is facilitated by the tubular body, an opening that can receive a pipette tip and a chamber having approximately the shape of a cuboid, having substantially equal side lengths. Unlike the present invention, Lehmann discloses flooding the process chamber, but does not disclose any kind of mixing of a reaction mixture. Furthermore, a rectangular shape is clearly less conducive to the efficient removal of nearly all liquid by a simple pipetting operation than an approximately cuboid shape with substantially equal side lengths.

The different designs of the cartridge in Lehmann and the reaction vessel in the present invention flow from their different intended purposes. Therefore, for example, the design of the chamber to have a tubular body and approximately the shape of a cuboid with substantially equal side lengths is not *a priori* routine optimization. Applicants first conceived of how the reaction vessel would be used before designing it to best carry out its intended function.

Moreover, as the Examiner appreciates, proposed modifications to a primary reference can not change the principle of operation of that reference. M.P.E.P. § 2143.01(VI). Here, for example, the cartridge of Lehmann was designed to be thin enough to provide visual access through element 22 to the first cavity and the active surface of the chip. *See*, Figure 1, abstract and paragraphs [0022-0023] of Lehmann. The shape of cavity 22 is determined by the intended function of the cartridge. *See*, paragraph [0023] of Lehmann. If the chamber in the cartridge of Lehmann was designed to be cuboid having substantially equal side lengths, the principle of operation of the cartridge would be altered. For example, the shape of cavity 22 would be too wide for effective visualization of the active surface of the chip.

In view of the foregoing, it is clear that the decision to design the reaction vessel of the present invention to have a tubular body with a chamber having an approximately cuboid shape with substantially equal side lengths is not based in routine optimization, but follows the

intended purpose of the reaction vessel. The cartridge employed by Lehmann is used differently, and therefore is fundamentally different. Because Lehmann does not disclose or suggest the utilitarian features of the present reaction vessels (*e.g.*, able to receive pipette tip, suitable for vortex mixing), Lehmann does not disclose or suggest the structural features of the present reaction vessel (*e.g.*, tubular body and approximately cuboid shape). Accordingly, Lehmann does not render the present invention obvious.

Lehmann in view of GB 2129551 ("Mochida")

The Examiner has rejected claim 25 under 35 U.S.C. § 103(a) as allegedly obvious over Lehmann in view of GB 2129551 ("Mochida"). To the extent that the present rejection applies to the present claims, Applicants respectfully traverse. Lehmann does not disclose, suggest or render obvious the present invention for the reasons discussed above. Combining the reaction vessels of Mochida with Lehmann, the primary reference, would render the cartridge of Lehmann unsuitable for its intended purpose for the reasons discussed above. Therefore, there is no motivation to combine the disclosures of Lehmann with Moschida. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



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